REVIEWS

California's Changing Landscapes. By MICHAEL BARBOUR, BRUCE PAVLIK, FRANK DRYSDALE, AND SUSAN LINDSTROM. 1993. California Native Plant Society. 244 pages. Softcover $24.95. ISBN 0-943460-17-4.

California's floristic diversity, composed of approximately 5000 native species and slightly over 1000 naturalized alien species, is organized into a remarkable assemblage of distinct to intergrading plant communities. Their collective ecological diversity is unparalleled in equivalent areas on the North American continent. Although much current interest is focused statewide on the abundance and threats to individual taxa, relatively less attention has been given to California's plant communities, higher order vegetation types or formations, and ecosystems. The authors have correctly drawn attention to these components of California's floristic diversity and the complex physiographic factors affecting its distribution and physiognomy. They have done so with eloquence and with an economy of words.

The text is divided into 8 chapters, of which the first introduces the concept of landscape as influenced by change over space and time. Geochronological events, fire, human interference, and interactions among regional topography, geological substrates, and climate are each introduced as major environmental determinants. The 5 following chapters, with eye-catching titles unencumbered by traditional phytosociological terms, are organized sequentially to give a longitudinal perspective of California's vegetation. This sequence begins with the immediate coast and continues eastward to include the coastal forests, the Central Valley, the Cascades and Sierra Nevada, and the eastern deserts. Although these physiographic regions are indeed predominant features of California's landscape, I found it disconcerting that the continuum of woodland and forest between the Klamath and Cascade Ranges was neglected. Also neglected was the southern fourth of California, where a central valley is lacking and the only major topographic barriers between the coast and desert are the Transverse and Peninsular Ranges.

Each of the 5 chapters devoted to major ecosystems reiterates themes of uniqueness, diversity, and change, enhanced by brief essays on the biology of selected species and their adaptation(s) to habitats characteristic or special to the chapter's topic. Most of these vignettes tantalize the reader with exciting examples of plant biology. Chapters on the coastal forests and California's high mountains offer succinct accounts of major forest communities and highlight the ecological factors that influence establishment of seedlings and the relative distribution of different species. Sadly, the authors did not emphasize the remarkable diversity of conifers, unsurpassed elsewhere in North America, that occurs in California's montane forests, especially in the Klamath Range. I found the chapter on California's Central Valley equable in the treatment of formerly widespread vegetational landscapes and their ecology. The discussions of much diminished riparian forests, tule marshes, grasslands, and foothill woodland in this chapter were particularly interesting from a historical view and provided a glimpse of what the pre-Spanish, Great Valley may have been like. On the other hand, the chapter on California's 3 major deserts, which comprise nearly 30% of the state's land area, did not seem to treat adequately what may well be the state's largest remaining assemblage of pristine plant associations.

The penultimate chapter, which summarizes the relationship between native Californians and the vegetational landscape, is not a traditional topic of plant and landscape ecology. However, it provides an illuminating perspective on the contrast between a 12,000 year history of pre-Spanish human presence and the seemingly

catastrophic interference and exploitation of the most recent 200 years. Much of its contents are devoted to specific examples of native plants important to the hunting-gathering culture of California's diverse native cultures. The extensive use of fire by native Americans, in the intelligent management of vegetation for sustenance, is given appropriate attention and should engender important ecological questions concerning the extent, structure, and recent geobotanical history of several natural plant community types.

The final chapter, which provides 3 scenarios to the restoration of vegetation, discusses issues of concern to all Californians. Each scenario provides a glimpse of the potential for and challenges to ecological restoration. Several apparently successful examples are discussed in the attempt to show what can be achieved with determination and cooperation among diverse interests. However, a few of these examples, in my opinion, may well represent efforts at reconstruction rather than restoration. The example of Santa Cruz Island needs clarification. The discussion makes no mention of failed attempts to remove feral pigs, whose activities probably contribute much to an apparently historical decline in bulbous taxa, the failure of oak regeneration from seed, and local substrate disturbance. Furthermore, the restriction of sheep to fenced pastures has not been successfully accomplished.

Although the book provides a broad view of natural history, some discussions or statements were too superficial and did not adequately convey the complexity of specific biological patterns. A few statements contained errors. I was dismayed to read (p. 36–37) that Big Sur is implicitly treated as a discrete boundary between evergreen-dominated northern coastal scrub and drought-deciduous southern coastal scrub. I would have preferred a discussion that emphasized the apparently patchy transition between these community types, a transition that actually extends as far south as western Santa Barbara County. I can't accept the Mojave Desert as an ecotone (p. 139) between the Great Basin and Colorado Deserts. Most phytogeographers consider it a floristic province, with its own endemic taxa and such unique communities as Joshua Tree woodland. Referring to *Sarcodes* as a parasite (p. 102) is incorrect and inconsistent with the definition of a parasite in the glossary. *Sarcodes* does not consume its host but rather derives its nutrition from conifers via a fungal intermediate. That Jeffrey and Ponderosa Pines "meet, mingle and miscegenate" (p. 112) seems a nicely executed alliteration. Unfortunately "miscegenate" has anthropomorphic and pejorative connotations and is not an appropriate synonym for the widely accepted and widely understood term "hybridize". The correct varietal name for Sierran white fir (p. 126) is var. *lowiana.* The leaves of cacti (p. 143) have not been "eliminated" during evolution, as the authors imply; rather they have been modified into glochids and spines. I was especially disappointed in the admittedly speculative treatment of grassland, a controversial subject of special interest to current restoration ecology. Although California botanists traditionally favor species of *Nassella* (formerly *Stipa*) as likely dominants, I found no meaningful biological explanation for this conclusion nor did I read why other common native species, including *Poa secunda, Muhlenbergia rigens,* and *Hordeum brachyantherum,* are rarely if at all considered. Much of the discussion centered on the pros and cons of grazing, first by native animals and later by feral animals. However, literature on food habits of both native elk and antelope, which comprised the grazing herds of Holocene California, suggests that grasses were a relatively minor dietary component. Interactions among several other ecologically important factors, including seasonal precipitation, fire, and competition for water determine the distribution of grasslands elsewhere in North America, but the same in California grasslands were not addressed.

These shortcomings detract somewhat from a book that otherwise lucidly conveys and summarizes the extensive scientific knowledge gained from many decades of study. The text is richly illustrated and the photographs are well chosen. Although the color plates are excellent, a number of black and white photographs are poorly reproduced. The text is complemented by a list of pertinent references and suggestions for further reading, an informative, carefully written glossary, and an index with cross-references to scientific names. The overall content and style reflect the collective

knowledge, experience, and skills of the several authors, each with different backgrounds and interests. Professional botanists need to read it as an example of what can be done to extend scientific knowledge and its applicability to general education and conservation efforts. Although not especially useful as a primary reference, this book represents an exceptional contribution by its authors and the California Native Plant Society to fostering interest, concern, and a continuing appreciation for the natural landscapes of California.

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Practical Handbook for Wetland Identification and Delineation. By J. G. Lyon. 1993. Lewis Publishers, Boca Raton. 157 pages. Hardcover $59.95. ISBN 0-87371590X.

This "practical handbook" is anything but practical, and attempting to follow its guidance will likely do more harm than good. Wetland delineation is a critical decision-making process that requires well-trained experts. This book is elementary in its language and approach, seeming to interpret the complexities of delineation for a lay audience, yet its intent is clearly to teach readers how to develop wetland delineation reports. It does not achieve either objective.

In addition to the awkward writing, repetitive wording, redundant statements, and grammatical errors (e.g., "From it stems the three criterion . . ."—p. 11) that litter virtually every page, the content is imprecise, misleading, and in many cases just plain wrong. I quote first from the section on plant measurements, which tells us how to record information on vegetation (p. 67): "The scientific names have two parts written in Latin. The first word is the family or generic name. . . . The second name is that of the individual plant or plant species in the family."

More importantly, the criterion for hydrophytic vegetation is repeatedly misstated: "A given site is determined to be a wetland for this criterion when the total dominance of FAC, FACW, and OBL plants exceeds 50% of the total dominant plants found on the site"—p. 26; "The procedure consists of determining whether 50% of the dominant plants have a high probability of occurring in wetlands"—p. 42; and "A given area is determined to be a wetland for this individual, jurisdictional criterion when the total abundance of FAC, FACW, and OBL plants exceeds 50% of the total frequency of dominant plants found at a given sampling location on the site"—p. 67. None of these renditions makes it clear that one must count the number of dominant species to determine if more than 50 percent are OBL, FACW, or FAC, and none of Lyons' advice correctly states that this is only ONE of the acceptable ways of meeting the vegetation criterion (see 1987 Federal Manual, p. 19).

The level of advice is highly variable. On page 37, a paragraph is devoted to pacing a 100-foot line—a simple task, yet a much more difficult procedure is not elaborated: "Record whether sample points have similar or dissimilar soils to those indicated by the county Soil Survey." Such decisions require technical knowledge and experience. Likewise, without much help, readers are instructed to sample sites at 100-foot intervals and then "supply the boundaries of any jurisdictional wetlands"—p. 44. The inclusion of numerous photographs (47 full pages or 30% of the book) might appeal to a general audience, but the captions use technical terms that are not defined, and they sometimes promise more than pictures can deliver (figure 2.3 on p. 10 is an inundated wetland, for which hydric soils are supposedly "evident").

My comments are lengthy, but it seemed necessary to document carefully this negative review. I cannot recommend the book for any audience. I suggest instead that prospective wetland delineators study the appropriate federal manual (currently the 1987 Wetlands Delineation Manual available from the US Army Corps of Engineers, Washington, D.C. 20314-1000).

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